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COMMUNICATION PATTERNS IN INTEGRATED CLASSROOMS AND PRE-INTEGRATION SUBJECT VARIABLES AS THEY AFFECT THE ACADEMIC ACHIEVEMENT AND SELF-CONCEPT OF PREVIOUSLY SEGREGATED CHILDREN.

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A RESEARCH PROJECT WAS CONDUCTED TO DETERMINE THE EFFECTS OF ONE YEAR OF SCHOOL INTEGRATION ON 87 LOWER-CLASS NEGRO ELEMENTARY SCHOOL STUDENTS IN A SUBURBAN NEW YORK COMMUNITY. IT WAS HYPOTHESIZED THAT THE INITIAL LEVEL OF STUDENTS' CONCEPT FORMATION, COGNITIVE STYLE (FIELD INDEPENDENCE), SELF-CONCEPT, AND INTERRACIAL CLASSROOM INTERATION WOULD RELATE POSITIVELY TO THEIR ACADEMIC ACHIEVEMENT AND SELF-CONCEPT AFTER INTEGRATION. IT WAS ALSO PREDICTED THAT AFTER INTEGRATION GRADE LEVEL AND ACADEMIC ACHIEVEMENT WOULD BE INVERSELY RELATED. CHANGES BEFORE AND AFTER INTEGRATION WERE MEASURED BY A VERBAL ABILITY TEST, TEACHER RATINGS, AND A SELF-CONCEPT TEST. THE NUMBER OF WHITE FRIENDSHIP CHOICES BY NEGRO STUDENTS WAS USED TO ASSESS PUPIL INTERACTION IN THE INTEGRATED CLASSROOM. IT WAS FOUND THAT ALTHOUGH THE PRE-INTEGRATION VARIABLES OF CONCEPT FORMATION, COGNITIVE STYLE, AND SELF-CONCEPT DID RELATE TO VERBAL ABILITY SCORES, THEIR PREDICTIVE POTENTIAL VARIED WITH GRADE AND SEX. TEACHER RATINGS WERE INVERSELY RELATED TO STUDENTS' SELF-CONCEPT AND UNRELATED TO MEASURES OF COGNITIVE STYLE AND VERBAL ABILITY. ALSO, THE TEACHERS RATED THE STUDENTS LOWER IN VERBAL SKILLS AFTER INTEGRATION THAN THEY HAD BEFORE, DESPITE STUDENTS IN GRADES 3 TO 5 PERFORMING MUCH CLOSER TO THE WHITE MEAN FOLLOWING INTEGRATION. NEGRO FRIENDSHIP CHOICES SHOWED THAT INTERRACIAL CLASSROOM INTERACTION WAS POSITIVELY RELATED TO ACADEMIC ACHIEVEMENT, BUT WAS INVERSELY RELATED TO SELF-CONCEPT, POSSIBLY BECAUSE NEGRO STUDENTS USED INTERRACIAL INTERACTION TO ENCOURAGE A LOWER SELF-IMAGE. (LB)

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INTRCDUCTION

Problem This project is concerned with the school integration in a small suburban New York community. The aim of the study is to help in the prediction of the academic and social effects of integration for the previously segregated children. Segregated Negro children as a group do not achieve academically at the same level as white children. However, the specific relationships between the characteristics of the child before integration and the effects of newly integrated experiences have been less thoroughly studied. Many studies are based on group tests and average scores, and it is difficult to discern individual differences in achievement. In the present study, previously segregated children were studied both before their integration, and following on year in an integrated setting. The problem in this study is the examination of the consequences of physical integration for the individual child.

Related Literature There is a large body of literature related to but not specifically treating the problem of predicting the effects of integration on the individual child who is a member of a minority group. Thus, the intellectual and emotional characteristics of environmentally deprived lower class children have been under scrutiny (7,12, 19). There is also considerable research evidence (4, 6) which indicates that culturally disadvantaged children differ from non-disadvantaged children in a number of specific cognitive areas which are related to their school achievement. The greater the cognitive deprivation--which increases each year if nothing is done in the way of amelioration-- the lower the academic achievement. (22,23). Denigrating self-concepts are also believed to relate directly to the Negro child's low status (20).

More recent reports (3,25) indicate that disadvantaged Negro children perform better in an integrated setting regardless of the social class level of their classmates. However, simply putting children together in integrated groups does not indicate which variables are related to academic achievement (5). Following integration there are still minority group children who experience academic difficulty. The complex and specific nature of the contact must be known, as well as the characteristics of the children under study.

Objectives The objective of this study is to determine which variables are related to academic achievement and self-concept changes in previously segregated children when they are in an integrated classroom. Segregated school experiences are those which took place in both the school and classroom in which 98% to 100% of the children were members of the same race. Schooling which occurs in racially mixed classrooms (all children in the community have an equal chance of being in any one classroom at their grade level) is the integrated school condition which was studied

More specifically this study is concerned with the influence of (1) the characteristics of the children before they enter the integrated classroom, i.e. level of concept formation, cognitive style, self-concept, white and Negro stereotype, and (2) classroom communication patterns in the integrated classroom on academic achievement and self-concept changes after integration. Because of the lack of ability to reliably analyze the selected measure of verbal communication between teacher and pupil, an analysis of sociometric choices had to serve as the single indicator of communication patterns. Therefore, this report is concerned primarily with the prediction of academic achievement following integration, based on the characteristics of the previously segregated children. The following hypotheses were investigated:

Hypothesis 1 - The higher the initial level of concept formation, the greater the progress following integration.

Hypothesis 2 - The higher the initial level of concept formation, and the more positive the self-concept of the child, the greater the achievement in the integrated classroom.

Hypothesis 3 - Field independent children with high levels of concept formation and a good self-image will show higher achievement than field independent children who do not have high levels of concept formation and a positive self-image. Field dependent children who have low initial levels of concept formation, and a poor self-image, will show low academic achievement.

Hypothesis 4 - There will be an inverse relationship between grade and academic achievement following integration.

Hypothesis 5a - There will be a positive relationship between the degree of interracial interaction within the classroom for Negro Ss and their level of self-concept.

Hypothesis 5b - There will be a positive relationship between the degree of interracial interaction within the classroom for Negro Ss and their academic achievement.

METHOD

Design The major independent variables in this study are the preintegration individual characteristics of the Negro children while in the segregated setting. The level of concept formation for preintegration subjects is defined by their scores on a non-verbal test of concept formation, individually administered during their last month in a segregated classroom. The cognitive style of the Ss is defined as their non-verbal solutions to an embedded figures test, individually administered to them under the segregated condition. This test classifies responses into field dependent and field independent cognitive styles. The preintegration self and racial concepts of Negro children in the study were found by their responses to a semi-projective closed ended test of self-concept and concepts of Negro and white stereotypes. The self-concept test was also individually administered while students were still in segregated conditions

The other independent variable, that of classroom communication and contact patterns, was measured using the Bales Interaction Process Analysis (1) and sociometric choices. The use of the Interaction Process Analysis to measure teacher-pupil verbal communication in the integrated setting proved too unreliable for any meaningful analysis of the data. Sociometric choices (17) were combined for all grade levels and analyzed in terms of the total number of white friends chosen by the Negro children.

The primary dependent variable is the "success" of the integrated school experience, defined in terms of the verbal achievement of previously segregated Negro children. Teacher ratings on the verbal, mathematics and social areas are another dependent measure. Change in self-concept and in white and Negro stereotype is an intervening variable. The previously segregated children were given self-concept measures before integration, and one year after the integrated experience.

A sample of students from the previously all white schools were measured on white and Negro stereotype and on self-concept, before integration and one year after integration.

Population and Sample The community chosen for the study was a middle class suburb in the Greater New York area. This community had a population of about 15,000 with a median educational level of 14.0 years. It was ethnically homogeneous with most families of English, Scotch and Irish descent. The mobility rate was relatively high, with 25% of the community having been in residence less than five years. Most residents were second echelon executives of large corporations, banks, brokerage firms, etc.

This community had been a stop on the underground railway during the middle of the previous century. Dating from that time,

there has been a small enclave of Negroes who were servants for the wealthier families. Many of the original inhabitants achieved middle-class status and moved to adjoining communities. During the past twenty years there has been a large influx of Southern Negro women, mostly domestics. No Negroes belonged to any of the middle-class organizations that monopolize the power in the community. Negro families exhibited mostly lower-class backgrounds.

Before integration there were three public grammar schools with nearly identical physical plants, comparable staffs and similar equipments. One of these schools, the Valley School, was 98% Negro. In 1965 its doors were closed and all Negro children were redistributed in the classes of the other two previously all-white schools. The total universe of all Negro children of grammar school age constituted the subjects in the study. This number was originally 110, but dropped to 87 by the close of the study, because many of the children had left the school system. Prior to integration, these Ss were in the first through the fifth grade, with ages ranging from 6 to 12 years. All came from a lower social class background as determined by a scale develcped by Martin Deutsch at the Institute of Developmental Studies. (See Appendix A-1).

Sixty-three randomly drawn students from the same grades constituted a representative group of the white elementary school children used for comparison purposes.

Measures Pre-Integration Measurement Instruments:

1. Leiter International Performance Scale (13). This is an individually administered test of concept formation with no time limits. The distinctive feature of the Leiter is its almost complete elimination of language, which is not required in instructions from the examiner, nor in the S's response. The test range is from the 2 to 18 year level with scoring computed in terms of months. Individual items cover a wide range of concepts: color matching, analogies, spatial relations, memory for a series, and classification of animals. With regard to validity, correlations with the Stanford-Binet Intelligence Scale range from .64 to .81. A split-half reliability coefficient (computed with the Spearman-Brown formula) of .94 was reported.
2. Children's Embedded Figures Test (9). This is a test of psychological differentiation which yields data on field dependent or field independent cognitive style. Each response is scored one or zero with a maximum possible score of 25. With regard to validity, correlation coefficients based on correlations of this test with the adult Embedded Figures Test range from .70 to .86.

2. Children's Embedded Figures Test (Continued) Tyron's internal consistency reliability coefficients ( ) range from .83 to .90[1].

3. Denmark Self-Concept Test. (Unpublished test developed by investigators. See Appendix B-1). The test utilizes a modified semantic differential scale (24) combined with three pictures. The pictures are identical except for race: one picture is of a white child, one of a Negro child, and one is an outline (no race). The semantic differential uses language taken from playground speech of children. The same semantic differential scale is used for each picture. The test is individually administered and comparisons are made for self, own race, and other race concepts. With the presentation of each picture, the subject is asked whether the child is short, tall, or inbetween, etc. Scoring is based on an "ideal" image which consists of the following positive attributes: hardworking, happy, strong, rich, serious, clean, quiet, healthy, good, warm, smart, fast and friendly. Each of these traits is given a value of +2, each opposite or negative trait is given a value of 0, and each response of in-between, a value of +1. The maximum possible total score for each concept is 26. Split-half reliability coefficients were determined for each picture, and ranged from .51 to .85 (see Appendix B-2).

Measures following one year of integration:

1. Achievement tests. All 4th, 5th, and 6th grade children took group achievement tests. (18). Individually administered vocabulary tests (11) were given to all subjects.

2. Self-concept measures. All subjects were retested on the self-concept test to measure changes in self and racial concepts following one year of integrated classroom experience.

3. Teacher ratings. Teachers rated each student in their class on verbal, mathematical and social skills.

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[1]The sample of white students was not tested on the Leiter or CEFT, due to administrative restrictions. However, from these students' basically upper middle-class backgrounds and generally high scores achieved on group tests as compared to standardized norms, it can be assumed that they would score average or above.

Analysis

1. Prediction of 1965 verbal ability scores. The small sample size, the relative frequency of missing data, and the absence of probabilistic sampling techniques favor an approach to the analysis of the data emphasizing the "proportion of variance explained" rather than the extensive use of significance testing. Coleman, in Equality of Education Opportunity, (3) finds the former technique to be an effective tool for analyzing the relationship between several independent variables and verbal ability scores.

   In the spring of 1964, two cognitive tests, the Leiter, and the Children's Embedded Figures Test (CEFT) tapped the level of concept formation and cognitive style respectively of the students of the Valley School. Three self-concept scores evaluated the student's perception of Negroes, whites, and themselves. A year later, in May of 1965, a vocabulary test and the same self-concept tests were administered to the same students. The vocabulary test measured the child's verbal ability in 1965[2]. The level of verbal ability represents the dependent variable to be predicted from the 1964 cognitive data, and the 1964 and 1965 self-concept data.

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[2]Subscales of the Stanford Achievement Test Battery might also have been used in addition to the Wechsler vocabulary test. However, the Stanford battery was administered only to students in the three upper grades in 1965, and, in fact, 1965 represented the first time this achievement test battery replaced the Iowa Achievement Test Battery. School norms on the Stanford were unavailable, so that the Stanford subscale scores could be standardized by the school system only in terms of the Iowa percentiles to allow meaningful comparisons. In addition the frequency of non-response was high.

On the other hand, all students in all grades completed the Wechsler vocabulary test, permitting some types of comparisons between Negroes and whites across all grade levels, and not just the three upper grades. The procedure to compare the performance of Negroes and whites pre and post integration entails standardizing the scores of Negroes by the white mean and then the Negro mean in terms of how many standard deviations it falls below the white mean, before and after integration. Standardizing in this manner bypasses the set of problems involved in the direct comparison of Iowa test scores with Stanford test scores for students in the lower grades, and the presence of Wechsler test scores in those grades provides a further support to the decision to employ the Wechsler measure alone, instead of with the Stanford, as the dependent variable.

The readministration of the self-concept scales in 1965 allows either the initial level of self-concept (1964) or the adjusted (1965) level (controlling for the child's initial level of self-concept in 1964) to be used as intervening variables in the prediction equation.

The conceptual model underlying the structure of the prediction equation (see Figure 1) first considers the cognitive variables. Verbal ability is assumed more directly related to the child's level of cognitive functioning than the child's self-concept. A high level of cognitive functioning represents a necessary precondition for a high level of performance on a verbal ability test; a high level of self-concept facilitates the most efficient utilization of the student's cognitive capacities. In accord with these assumptions then, the self-concept measures constitute an intervening variable. The variance attributable to the self-concept measures represents residual variance to be analyzed after the effect of the cognitive variables have been removed.

Whether the initial level of self-concept (1964 measurements) or the change in self-concept (the 1965 measurement controlling for the 1964 measurement) contributes more to the explanation of the residual variance deserves careful consideration. The variance that remains after the removal of the cognitive variables and the 1964 self-concept measurements constitutes the effect of the change in level of self-concept and the remaining error variance.

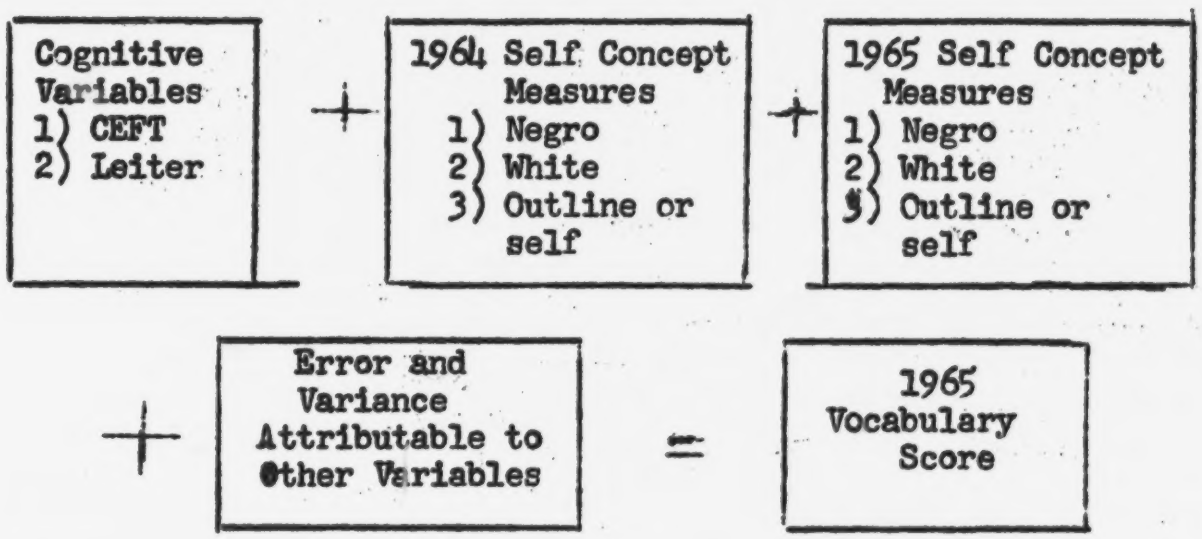

Figure 1. CONCEPTUAL MODEL OF PREDICTION EQUATION

To estimate the proportion of variance each class of variables accounts for, regression methods provide suitable techniques. First, the square of the multiple correlation coefficient, R^2, is computed for only the cognitive variables; this estimates the proportion of variance the cognitive variables account for as predictors of vocabulary score. Next the regression equation is expanded to include the 1964 self-concept variables. This reduces the amount of residual variance left after the removal of the cognitive variables. The difference between the square of the multiple correlation coefficient with only the cognitive variables as predictors and the square of the multiple correlation coefficient with both the cognitive and 1964 self-concept variables as predictors equals the proportion of variance that may be attributed to the 1964 self-concept variables after the effects of the cognitive variables have been removed. This procedure is repeated to estimate the proportion of variance attributed to the 1965 self-concept measures, controlling for the 1964 level of self-concept. Blalock discusses this approach in its entirety (2).

Let $R^2_{v \cdot cl}$ = The proportion of variance accounted for by the cognitive variables, i.e. the CEFT and the Leiter.

$R^2_{v \cdot cl(SC64)}$ = the proportion of variance accounted for by the cognitive variables and the 1964 self-concept measures.

$R^2_{v \cdot cl(SC64)(SC65)}$ = the proportion of variance explained by the cognitive variables, the 1964 self-concept measures and the 1965 self-concept measures.

The increment in the proportion of variance explained with the addition of the 1964 self-concept measures is $R^2_{v \cdot cl(SC64)} - R^2_{v \cdot cl}$.

The increment in proportion of variance explained with the addition of the 1965 self-concept measures is $R^2_{v \cdot cl(SC64)(SC65)} - R^2_{v \cdot cl(SC64)}$.

Other variables that may confound the accuracy of prediction are sex and grade level. Grades one and two were pooled to form one group; likewise grades three through five were pooled to form another group. Crossing sex with the two grade levels results in four groups, each of which will be analyzed separately.

GRADES 1 - 2 MALES	GRADES 1 - 2 FEMALES
GRADES 3 - 5 FEMALES	GRADES 3 - 5 FEMALES

Each of these four groups has a separate regression equation. The use of four regression equations, instead of one for both sexes and all grades, directly controls for the effect of sex and grade level of the student before the effect of the other predicted variables are considered. Interaction effects between sex and grade level of each student would remain unrevealed if these controls were neglected.

Thus, to predict verbal ability in 1965 for Negroes from cognitive and self-concept variables, four regression equations are used instead of one. Within each regression equation the effect of cognitive variables is first removed, then the 1964 self-concept measures and finally the 1965 self-concept measures, after the effect of the 1964 self-concept measures has been eliminated. Coleman (3) and Lohnes (5) eliminate the effect of sex and grade in their analyses of similar data.

2. Comparisons. The independent variables, the changes in self-concept on each of the three scales, the verbal ability scores, teacher ratings, and the relationship of all other measures to teacher ratings will be compared for the Negro students and the sample composed of white children. Differences in means for each group, controlling for grade level, will be one approach utilized in this section of the analysis. The other approach employs contingency tables with the relevent variables dichotomized at the median to form two categories (usually "high" and "low"). The comparison made between groups on the basis of the last method will emphasize percent differences rather than inductive statistics. Failure to satisfy the assumptions of randomness and frequency of non-response necessitates this approach.

Comparisons will also be made between number of white friendship choices made by Negro students and their scores on the postintegration measures.

RESULTS

The means and standard deviations on the pre- and post-integration measures for Negroes and whites, separately, classified by grade level are presented in Table 1[3]. In 1964 the Leiter Test of concept formation and the Children's Embedded FiguresTest, were administered to Negro students only, whereas self-concept measures were administered to all Negro students and the randomly-drawn representative sample of whites. The same sample of students, Negro and white, responded to the self-concept scales again in 1965.

Teacher ratings were also available for all Negroes and whites in 1964 and 1965 as were verbal ability test scores for all students in the upper grades in 1964. A modified Wechsler vocabulary scale was administered to all students in 1965.

On the two non-verbal cognitive measures, administered to Negro students prior to integration; i.e., the Leiter (scored in months) and the CEFT (with a maximum of 25 at the field independent pole), the obtained results are within the average or low average range. The mean score in months on the Leiter corresponded to the Ss chronological age; their CEFT scores were approximately 1SD below reported mean scores (9).

Also prior to integration, no differences were found between Negro and white children on any measure of self-concept.

In 1965, following one year of integration, the concepts for own and other race did not differ from the 1964 measures for either white or Negro students.[4] Nor was there a change in own self-concepts for the white or Negro children in grades 3 - 5. However, for those children in grades 1 and 2, unexpected results were obtained.

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[3]Although grade levels are broken down into 1-2 and 3-5, following integration, in 1965, these figures refer to grades 2-3 and 4-6.

[4]The scores for own and other race concepts were not related in any way to verbal ability, teacher ratings or friendship choices. Hereafter the term self-concept will be used to refer only to the outline or own self-concept measure.

TABLE 1

Means and S. D.'s by Grade Level and Race for all Test Variables

		GRADES 1 AND 2				GRADES 3 THROUGH 5			
		NEGRO		WHITE		NEGRO		WHITE	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Cognitive Measures	CEFT	8.21	4.5	---	---	11.14	5.1	---	---
	Leiter	94.38	15.4	---	---	120.81	19.8	---	---
Self Concept	Negro	16.90	4.5	16.95	3.6	17.83	4.1	17.90	3.0
	White	16.39	4.8	17.27	3.4	17.64	3.7	16.61	3.0
	Outline or Self	19.07	5.6	19.41	3.7	18.68	4.1	19.66	2.9
Teacher Ratings	Verbal	5.28	0.9	5.54	0.5	3.25	0.6	4.06	0.6
	Mathematical	4.90	1.0	5.91	0.4	3.35	0.7	4.07	0.9
	Social	5.28	0.8	5.50	0.4	4.98	0.9	5.30	0.7
Verbal Ability	Vocabulary	14.84	4.5	20.14	6.1	19.88	4.7	26.19	6.6
Self Concept	Negro	16.90	4.6	16.5	3.0	17.81	4.1	16.51	3.0
	White	16.28	4.4	16.2	3.1	16.38	3.9	15.74	3.0
	Outline or Self	21.72	3.2	17.1	3.2	19.49	3.5	18.40	3.0
Teacher Ratings	Verbal	4.15	1.0	5.18	0.5	3.25	0.7	4.28	0.7
	Mathematical	3.86	1.2	5.19	0.4	3.34	0.8	4.03	0.9
	Social	5.19	0.7	5.49	0.4	3.97	1.0	5.41	0.7
Number of Students		34		22		53		41	

Following integration, the self-concept of these Negro children increased; for the younger white children there was a significant decrease.[5]

White students received higher teacher ratings than Negroes in all three classes of skills, i.e., verbal, mathematical and social, in both 1964 and 1965.

Verbal Ability For grades 3 through 5 it is possible to assess the effect of integration on the verbal ability scores of Negroes. In 1965 all students completed a test to ascertain their vocabulary level. During the spring of 1964 before integration the same sample of students completed the Iowa Achievement Test series, and one scale in this test battery focuses on the students' vocabulary level.

Employing Coleman's technique (3, pp. 273-275) of evaluating the Negro means in terms of how many standard diviations they fall below the white mean, it is possible to compare the 1964 and 1965 vocabulary means so that the effect of integration can be assessed. (See Table 2).

TABLE 2

Means and Standard Deviations for 1964 Iowa Vocabulary Scale and 1965 Wechsler Vocabulary Scale for Negroes and Whites in Grades 3 Through 5 by Sex

	IOWA VOCABULARY SCALE 1964 GRADES 3 THROUGH 5				WECHSLER VOCABULARY SCALE 1965 GRADES 3 THROUGH 5			
	NEGRO			WHITE	NEGRO			WHITE
	Both	Male	Female		Both	Male	Female	
MEAN	-0.707 n=53	-.563 n=36	-1.080 n=17	0.405 n=37	19.88 n=53	20.12 n=36	18.69 n=17	26.19 n=37
STANDARD DEVIATION	-1.41	-1.22	-1.88	0.790	-0.96	-0.90	-1.13	6.61
BELOW WHITE MEAN	MEANS ARE Z SCORES				MEANS ARE RAW SCORES			

Based on the vocabulary scale of the Iowa Tests of Basic Skills (14), which was administered by the schools before integration, the Negro mean falls 1.41 standard deviations below

[5] All differences in means cited in text are significant at the .05 level or below.

the white mean in 1964. After integration the Negro mean on a comparable vocabulary test falls 0.96 standard deviations below the white mean. Sex plays an important role in the explanation of the true relationship. Negro females in 1964 functioned at a verbal ability level 1.88 standard deviations below white students, whereas at the same time Negro males functioned at a higher verbal ability level compared to female Negroes; their mean fell 1.22 standard deviations below the white mean. The 1965 test data reveal that Negro females improve twice as much as Negro means in terms of how many standard deviations below the white mean their respective means fall. The mean score of females increases from -1.88 standard deviations below the white mean to -1.13 standard deviations below the white mean, an increase of .75 standard deviations in the integrated setting. Boys also tend to improve; in 1964 their mean was 1.22 standard deviations below the white mean, whereas in 1965 their mean climbed to 0.90 standard deviations below the white mean-- an increase of .32 standard deviations. Negro females close the gap between their performance and white students' performance on measure of verbal ability by a ratio of 2:1 over males, but, nevertheless still remain about 1/4 of a standard deviation behind Negro males in their performance.

For grades 1 and 2 the lack of a suitable measure of verbal ability for Negroes and white in 1964 prevents a comparison to assess the effect of integration in the same manner as the data for grades 3 through 5. Nonetheless, in 1965, as seen in Table 3, the Negro mean, for first and second graders on the vocabulary test was 0.88 standard deviations below the white mean--similar to Negroes in grades 3 to 5.

TABLE 3

Means and Standard Deviations of 1965 Vocabulary Scale for Negroes and Whites in Grades 1 and 2 by Sex

VOCABULARY SCALE 1965				
	N E G R O			WHITE
	Both	Male	Female	
MEANS (In Raw Scores)	14.84 n=34	15.93 n=15	13.95 n=19	20.10
STANDARD DEVIATIONS (Below White Mean)	-0.88	-0.69	-1.13	White Standard Deviation 6.01

However, the mean for male Negroes was only 0.69 standard deviations below the white mean, whereas, the mean for female Negroes stagnated 1.13 standard deviations below the white mean.

The Relationship of Cognitive Variables to Verbal Ability

In accord with the experimental design, the relationship between the cognitive variables measured in 1964 and the vocabulary scores assessing verbal ability in 1965 was assessed. (See Table 4). As noted previously the effect of grade is controlled for directly by performing the same analysis for students in grades 1 and 2 combined into one group with students in grade 3 through 5 combined into another group for separate analysis.

TABLE 4

Correlations of Cognitive Variables and Vocabulary by Grade Level for Negroes

	Grades 1 and 2		Grades 3 through 5	
	LEITER	CEFT	LEITER	CEFT
LEITER '64	1.00	0.54	1.00	0.52
CEFT '64	0.54	1.00	0.52	1.00
VOCABULARY '65	0.38	0.57	0.44	0.38

For both grade levels the Leiter and CEFT correlate highly: .54 for grades 1 and 2; .52 for grades 3 through 5. This correlation raises questions about the independence of the measures of cognitive style and the student's level of concept formation. The CEFT and the student's vocabulary score also correlate strongly for students in grades 1 and 2: $r = .57$, but only moderately for students in grades 3 through 5: $r = .38$. For the older Negro students, the Leiter relates to the vocabulary in a stronger manner than does the CEFT.

Because of the high intercorrelation between the Leiter and CEFT, their correlations with the vocabulary may reflect the correlation between themselves rather than a true correlation with the vocabulary tests. To assess each test's independent correlation, "partial r's" are necessary. (See Table 5).

TABLE 5

Partial Correlations of Cognitive Variables with Vocabulary by Grade Level

GRADES 1 AND 2	GRADES 3 THROUGH 5
Leiter-Controlling for CEFT-with 1965 Vocabulary	Leiter-Controlling for CEFT-with 1965 Vocabulary
rLV.C = .11	rLV.C = .31
CEFT-Controlling for Leiter-with 1965 Vocabulary	CEFT-Controlling for Leiter-with 1965 Vocabulary
rCV.L = .48	rCV.L = .19

For grades 1 and 2 the correlation between the Leiter and the vocabulary test drops from .38 to .11 when you control for the CEFT, whereas the correlation between the CEFT decreases from .57 to .48 when you control for the Leiter test. This points to the spurious quality of the Leiter-vocabulary relationship: its initial moderate correlation almost entirely the result of its intercorrelation with the CEFT. Negroes in grades 1 and 2 who score highly on the CEFT in 1964 (i.e. are field independent) will tend to score highly in 1965 on the vocabulary test. However, in the case of the Negro students in grades 3 through 5, the value of the correlation between the CEFT and the vocabulary becomes exactly half of its previous value before controlling for the effect of the Leiter: rCV = .38; rCV.L = .19. The correlation for Negroes in grades 3 through 5 decreases from .44 to .31 when you control for the CEFT. The lack of clear relationship upon controlling for these variables may point to another variable confounding the relationship.

Sex of the student may be the variable that confounds the relationship between the CEFT, Leiter, and vocabulary test-especially for grades 3 through 5; and it may unmask a hidden relationship for grades 1 and 2.

TABLE 6

Correlations of Cognitive Variables and Vocabulary by Sex and Grade Level for Negroes

	GRADES 1 AND 2				GRADES 3 THROUGH 5			
	MALES		FEMALES		MALES		FEMALES	
	Leiter	CEFT	Leiter	CEFT	Leiter	CEFT	Leiter	CEFT
LEITER '64	1.00	0.40	1.00	0.65	1.00	0.56	1.00	0.41
CEFT '64	0.40	1.00	0.65	1.00	0.56	1.00	0.41	1.00
VOCABULARY '65	0.50	0.63	0.22	0.36	0.44	0.24	0.48	0.67

Even before partialing out the effect of the cognitive variables, one upon another—after controlling for sex, some drastic changes occur in the correlational structure. (See Table 6). Both tests correlate more highly for Negro males in grades 1 and 2 with their 1965 vocabulary scores: r = .50 for the Leiter; r = .63 for the CEFT. For females both correlations of the cognitive tests with their 1965 vocabulary decrease: r = .22 for the Leiter; r = .36 for the CEFT, while at the same time the intercorrelations of the two 1964 cognitive variables increases to .65.

A sex control greatly affects the relationship between the CEFT and the 1965 vocabulary test for grades 3 through 5 Negroes. The correlations for females jump to .67 but for males reduces to .24. This control for sex points out an extreme interaction effect for Negroes in the third through the fifth grade. Without this control the correlation remains at a moderate level of .38 (Table 4), but with the control for sex the true nature of the relationship appears.

Table 7 reveals the true nature of the relationship between the 1964 cognitive variables with the 1965 vocabulary scores taking into account the high interrelations between the CEFT and the Leiter.

TABLE 7

Partial Correlations of Cognitive Variables with Vocabulary by Sex and Grade Level for Negroes

GRADES 1 AND 2		GRADES 3 THROUGH 5	
Leiter-Controlling for CEFT-with 1965 Vocabulary		Leiter-Controlling for CEFT-with 1965 Vocabulary	
Males	Females	Males	Females
rLV.C = .35	rLV.C = -.01	rLV.C = .39	rLV.C = .30
CEFT-Controlling for Leiter-with 1965 Vocabulary		CEFT-Controlling for Leiter-with 1965 Vocabulary	
Males	Females	Males	Females
rCV.L = .55	rCV.L = .31	rCV.L = -.02	rCV.L = .62

Grades 1 and 2 Negro males' 1965 vocabulary scores are affected by both the Leiter and the CEFT. The partial correlation decreases for both the Leiter and the CEFT, though less for the latter. The refusal of one partial to vanish indicates that both test scores contribute independently to the explanation of the variance in their 1965 vocabulary scores. The multiple R for the two independent variables equals .68, accounting for the variance.

Negro females' performance in grades 1 and 2 on the Leiter has little predictive power for their 1965 vocabulary score; their level of concept formation appears unrelated to their verbal ability in the following year. Their cognitive style as measured by the CEFT relates moderately to the 1965 vocabulary socres. The high intercorrelation between the Leiter and the CEFT, [r = .65, (Table 6)], in view of the Leiter's lack of correlation with vocabulary, points to another unknown variable correlating with both of them. The two cognitive variables explain only 12.9% of the variance of the 1965 vocabulary score.

For Negroes in grades 3 through 5 the reverse relationship occurs when a sex-control is administered. For this grade level the cognitive variables predict more accurately for females than males. The multiple R for grades 3 through 5 females is .79, explaining 62.8% of the variance in the 1965 vocabulary score. For Negro females at this grade level the correlations between each of the two cognitive variables and the measure of verbal ability are higher (compare them in Table 6); and the inter-correlation between the two cognitive variables is lower: rCV = .65 for grade 1 and 2 females compared to rCL = .41 for

grade 3 through 5 females. This type of correlational structure implies a greater independent contribution to the explanation of the variance in the 1965 vocabulary scores on the part of each cognitive variable.

When the effects of the intercorrelation among the two cognitive variables are partialled out, the CEFT-vocabulary correlation remains stable dropping from .67 to a partial of .62 (Table 7); the partial r of the Leiter and the 1965 vocabulary drops to .31 from .48, yet it does not vanish. Both of these variables contribute heavily to the explanation of the variance associated with 1965 vocabulary scores of grades 3 through 5 females.

The grades 3 through 5 male correlational structure resembles the grades 1 and 2 female correlational structure quite closely, once the effects of the cognitive variables upon one another are partialled out, in the sense that one partial vanishes. The partial correlation between the CEFT and the vocabulary score indicates that the relationship vanishes when you control for the effect of the Leiter (Table 7). However, the relationship for grades 3 through 5 males between the Leiter and the 1965 vocabulary test remains stable; the partial decreasing to only .39 from .44 when you control for the effect of the CEFT. The multiple R for grades 3 through 5 males exhibits only moderate strength: R = .53, accounting for only 27.9% of the variance.

Controlling for the sex and grade level before analyzing the correlational structure of the 1964 cognitive measures and the 1965 verbal ability measure reveals a severe sex-grade interaction. Cognitive variables alone appear to be good predictors for grades 1 and 2 males and grades 3 through 5 females. In these two cases the CEFT correlates more strongly with the measure of verbal ability than the Leiter, pointing out that field independence is associated with high verbal performance. The Leiter test adds an independent contribution nonetheless; the partial correlation does not vanish when you control for the effect of the CEFT. Leiter results play some part as a determinant in verbal ability in 1965, but a lesser one than field independence for these two groups.

In the case of grades 1 and 2 females, the Leiter has little effect in predicting verbal ability and the CEFT only a moderate effect in this prediction. Grades 3 through 5 males exhibit a correlational structure which is the inverse of grades 1 and 2 females; i.e., where the CEFT has no predictive power in relation to the 1965 vocabulary scores and the Leiter contributes moderately to its prediction after the effect of the CEFT has been removed. The structure shows some similarity in the sense that cognitive variables alone prove to be poor predictors of verbal ability for these two groups and one partial completely

vanishes. The proportion of variance accounted for by the 1964 cognitive variables for these two groups is much lower than is the case for grades 1 and 2 males and grades 3 through 5 females. Other variables must be more important to grades 1 and 2 females and grades 3 through 5 males than the cognitive ones for the prediction of 1965 verbal ability.

Prediction Equations The differences revealed in Table 8 demonstrate the differential effect of the cognitive and self-concept variables' power to explain the variance in the 1965 vocabulary scores of the Valley School Negroes. For grades 1 and 2 females, the 1964 self-concept measurements contribute a substantial amount to the explanation of the dependent variable's variance--the multiple R increases from .36 to .78, and the percent of variance explained jumps from 12.9% to .610%, an increment of 48.1%. The large increment in the percent of variance explained by the 1964 self-concept measure for the group exceeds all other groups by almost a 4 to 1 ratio--increases for the others ranging from 0.5% to 14.0%. In fact, for grades 1 and 2 females the initial level of self-concept constitutes the best predictor of the 1965 verbal ability performance.

The effect of the 1965 level of self-concept in terms of the percent of variance explained represents a further attempt to reduce the residual variance. This percent of variance explained accounts for the effect of the 1965 self-concept measure after the effect of the 1964 self-concept measure has been removed. Its effect is most important for grades 1 and 2 Negro males where it accounts for approximately 37.5% of the residual variance that remains after the removal of the first two classes of variables. This multiple R climbs from .76 to .96 with the addition of the 1965 self-concept measurements. Grades 1 and 2 Negro males who scored highest in verbal ability in 1965 seemed to have been those who initially performed well on the 1964 cognitive tests, especially the CEFT, and whose self-concept ratings were highest in 1965.

TABLE 8

Multiple R and Percent of Variance Explained by Cognitive Variables, Self-Concept 1964, and Self-Concept 1965 with 1965 Vocabulary Test, for Negroes by Grade Level and Sex

	GRADES 1 AND 2				GRADES 3 THROUGH 5			
	Males		Females		Males		Females	
	R	R^2 increment	R	R^2 increment	R	R^2 increment	R	R^2 increment
Cognitive Variables 1 CEFT 2 Leiter	.68	46.5	.36	12.9	.53	.27.9	.79	62.8
Self-Concept 1964	.76	11.9	.78	48.1	.53	0.5	.88	14.0
Self-Concept 1965	.96	33.6	.82	5.2	.54	1.4	.96	15.7
TOTAL	---	92.0	---	66.2	---	29.8	---	92.5

The verbal ability scores of grades 3 through 5 Negro females are quite accurately predicted by these three classes of variables--they explain 92.5% of the variance. Cognitive variables account for 62.8% of the total variance indicating their extreme importance to the prediction equation. Whereas grades 3 through 5 Negro females' verbal ability scores are most successfullypredicted by these classes of variables, grades 3 through 5 Negro males' verbal ability scores are least successfully predicted by those 3 sets of variables. For this group only 29.8% of the total variance is explained by these three sets of variables and 96.3% of this explained variance can be directly attributed to the grades 3 through 5 Negro males' performance on the 1964 cognitive tests, with their self-concept of little importance. Table 7 points out that their performance on the Leiter test alone accounts for the proportion of variance explained by the cognitive variables.

Controlling for sex and grade level enabled the formation of four prediction equations, which revealed that the variables differed in importance for each group.

Teacher Ratings Since there are no sex differences apparent among teacher ratings, the control for sex has been dropped. The verbal skills teacher rating for Negroes in 1965 correlates +.189 with their vocabulary score in grades 1 and 2, but for grades 3 through 5 the correlation drops to -.49. (Table 9). For whites the pattern exhibits even more confusion. In grades 1 and 2 the correlation between their verbal skills teacher rating in 1965 and their vocabulary score of the same year is moderately negative: r = -.315, and for grades 3 through 5 white students it is moderately positive; r = .433.

TABLE 9

Correlations of 1965 Vocabulary and 1965 Verbal Teacher Rating by Grade Level and Race

	1965 VOCABULARY SCALE			
	Grades 1 and 2		Grades 3 - 5	
	Negro	White	Negro	White
1965 Verbal Teacher Rating	0.189	-.315	-0.49	.433

Contingency tables reveal more interesting relationships about teacher's perceptions of the verbal classroom skills of Negroes and whites (See Table 10). Each teacher rating was dichotomized at the median, computed for the entire sample of each grade of Negroes and whites, and then pooled together. In 1965, after integration, 26.7% of all Negroes in grades 1 and 2 with low teacher ratings in 1964 received high ones in 1965, whereas 100% of all whites in grades 1 and 2 with low teacher ratings in verbal skills in 1964 received high teacher ratings in 1965-- a difference of 73.4% in favor of the whites. Not one of these white student with low verbal skills teacher ratings in 1964 was perceived that way in 1965; all received high 1965 teacher ratings in these skills.

TABLE 10

Verbal Teacher Rating 1964 and
Verbal Teacher Rating 1965 by Race and Grade Level

VERBAL TEACHER RATING 1964

		N E G R O				W H I T E			
		Grades 1 and 2		Grades 3-5		Grades 1 and 2		Grades 3-5	
		Low	High	Low	High	Low	High	Low	High
VERBAL TEACHER RATING 1965	Low	73.3 n=11	61.5 n=8	84.8 n=28	42.9 n=6	0.0 n=0	33.3 n=6	75.0 n=6	7.1 n=2
	High	26.7 n=4	38.5 n=5	15.2 n=5	57.1 n=8	100.0 n=8	66.7 n=3	25.0 n=2	92.9 n=26
		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Negroes in grades 3 through 5 tend to improve even less than those in grades 1 and 2 in the eyes of their teachers when it comes to the effective use of their verbal skills in the classroom. Only 15.2% judged low in verbal skills were rated high in 1965; however, 42.9% of those Negroes judged high the previous year by their teachers were perceived low in their use of verbal skills in the classroom by their 1965 teacher. White students in grades 3 through 5 do not improve extensively either; only 25.0% of those rated low in 1964 receive high ratings in 1965 by their teachers for the way they utilize their verbal skills. However, only 7.1% of the whites drop from a high rating in verbal skills in 1964 to a low one in 1965 as compared with the 42.9% of all Negroes--a percent difference of 35.8% in favor of the whites.

Curiously, teachers in grades 1 and 2 are more likely to rate Negroes high on verbal skills if they score low on self-concept: 40% of all Negroes with a low self-concept receive a high teacher rating as opposed to 27.3% with a high concept of self, a difference of 12.7% favoring those with a low sense of self-concept (See Table 11). Whites in grades 1 and 2 on the other hand, have a higher probability of being rated highly proficient in verbal skills within the classroom if they score high on the self-concept scale: 83.3% of all whites with a high self-concept score receive a high teacher rating in verbal skills as compared to 72.7% of those with a low self-concept. This percent difference of 10.6 is in the opposite direction of the percent difference for the Negroes in grades 1 and 2.

In grades 3 through 5 the data indicate a similar relationship: 25.6% more whites with a high sense of self-concept receive a high teacher rating in verbal skills than do those with a low sense of self-concept. Negroes are more likely to be perceived highly proficient in verbal skills if they score low in self-concept. Seventeen percent more Negroes with a low self-concept score; compared to those with a high self-concept score, receive a high teacher rating in verbal skills. The percent difference again reflects the opposite direction of the white relationship.

TABLE 11

Self Concept 1965 and Verbal
Teacher Rating 1965 by Grade Level and Race

		SELF CONCEPT 1965							
		NEGRO				WHITE			
		Gr 1 and 2		Gr 3 - 5		Gr 1 and 2		Gr 3 - 5	
		Low	High	Low	High	Low	High	Low	High
1965 Verbal Teacher Ratings	Low	60.0 n=3	72.7 n=11	57.9 n=11	73.9 n=17	27.3 n=3	16.7 n=1	33.3 n=6	7.7 n=1
	High	40.0 n=2	27.3 n=6	42.1 n=8	26.1 n=6	72.7 n=8	83.3 n=5	66.7 n=12	92.3 n=12

Relationships between the mathematical and the social skills teacher ratings fail to emerge in any interesting or consistent pattern between themselves or with other background variables for Negroes or whites at any grade level.

Friendship Choices The small number of respondents to the sociometric questions necessitated the elimination of both sex and grade level distinction. In this case also, the variables employed as the dependent variables were dichotomized at the median for each grade and then the results pooled: all those who scored above the grade level into one group; all those who scored below their median into another group. For example, vocabulary scores were classified high or low relative to the performance in that grade, then all students from all grades who scored below their respective medians were termed "lows", those who scored above, "highs".

Table 12 reveals that Negroes who choose two or more white friends tend to score low on the self-concept scale.

TABLE 12

White Friendship Choices by Negroes
by 1965 Self Concept Outline

		WHITE FRIENDSHIP CHOICES	
		0-1	2 or more
Self Concept Outline 1965	Low	14.3% n=2	60.0% n=12
	High	85.7% n=12	40.0% n=8
		100.0%	100.0%

The percent difference of 45.7% in number of white friendship choices for those high and low in self-concept indicates that the number of white friends a Negro chooses is related to his sense of self-concept. Choosing two or more white friends also relates to both higher teacher ratings (Table 13) and a high level of performance on the Wechsler vocabulary test (Table 14). More than 30.7% of all Negroes with two or more white friends receive high teacher ratings than those with none or one white friend.

TABLE 13

White Friendship Choices by Negroes
by 1965 Verbal Teacher Ratings

		WHITE FRIENDSHIP CHOICES	
		0-1	2 or more
1965 Verbal Teachers Rating	Low	85.7% n=12	55.0% n=11
	High	14.3% n=2	45.0% n=9
		100.0%	100.0%

Likewise, 32.4% more Negroes who have formed two or more white friendships score high on the Wechsler vocabulary test.

TABLE 14

White Friendship Choices by Negroes
by 1965 Vocabulary Score

		WHITE FRIENDSHIP CHOICES	
		0-1	2 or more
1965 Vocabulary	Low	71.4% n=10	40.0% n=8
	High	28.0% n=4	60.0% n=12
		100.0%	100.0%

Friendship choices appear unrelated to a student's previous years performance on the CEFT and Leiter tests. If the sample size were larger, then the controls for sex and grade level would be possible and a different relationship might emerge.

DISCUSSION

The children from the Valley School achieved scores within the average range on both the Leiter and the CEFT, based on reported national norms for these tests. In fact, the score on the Leiter corresponded quite closely to chronological age.

This may be partially created by the fact that the segregated school was comparable in fact, to the white schools in both physical plant and staff.

Of course, both were non-verbal tests, so that any existing language deficits would not be readily reflected in these scores. However, on the CEFT, which generally proved more closely related to verbal achievement than did the Leiter, the Negro children's scores were approximately 1 S.D. below the established norms. This is in accord with test scores findings reported by Coleman (3).

Thus, despite some possible beneficial effects of a "good" segregated school, as reflected in the Leiter scores, the verbal achievement results in this study indicate the value of an integrated setting. Males and females in grades 3 - 5 performed closer to the white mean after integration than they did the year before.

In 1965, males in grades 1 and 2 perform verbally at a mean level 0.69 standard deviations below the white mean, yet on grades 3 through 5 a comparable group of males perform verbally at level 0.90 standard deviations below the mean white level of performance in 1965. Females, on the other hand, perform at about the same level after integration in both grade levels. This set of data implies that male Negroes lose more ground compared to white students as their grade level increases. However, females do not, as measured by the post-integration measures. One possible explanation might be the more deleterious effect of a disadvantaged home background on older boys.

Females improve more than males once in the integrated setting. After integration, Negro females gain .75 standard deviations on white students, while Negro males gain only .32 standard deviations on white students. Nevertheless, the Negro male mean level of verbal ability approaches the white mean level of verbal ability (0.90 standard deviations below it) more clearly than the females. (1.13 standard deviations below it). The larger change on the part of the females may indicate that rates of improvement vary depending upon magnitude of the initial deficiency. Improvement may be easier for female Negroes for the simple reason that they were so far back to start

with that they can only improve if given the chance.

A preintegration verbal ability measure for grades 1 and 2 would have enlightened the true relationship, i.e., does the rate of female improvement mean that they are making up for a greater deficiency that accumulates more quickly over time, or does 3 to 5 years in a segregated setting effect their verbal ability performance more drastically than males.

Cognitive Variables and Verbal Ability The two measures used in 1964, the Leiter test of concept formation and the CEFT, predict verbal ability differentially depending upon the grade level and sex of the Negro student. Field independence in all cases correlates with the student's Leiter test score, correlations ranging from .40 to .65 (Table 6). This contradicts the assertion that cognitive style is independent of all measures of IQ except for a few perceptual ones (8). The highest correlation between the two tests occur for females in grades 1 and 2. Negro girls' ability to differentiate cognitively at this age appears to be a function of their level of concept formation. Negro boys initially demonstrate an inverse relationship. As they become older their ability to differentiate cognitively becomes more a function of their level of concept formation. If boys' cognitive style becomes increasingly more oriented to a "differentiation" in terms of abstract principles as they grow older and females' style relies more upon contextual principles, then these correlations might not appear so anomalous (16).

The relationship of these variables to vocabulary scores becomes apparent only after the effect of one upon the other has been eliminated. The CEFT constitutes the most important single variable as a predictor of verbal ability, especially for first and second grade Negro males and third through fifth grade Negro females, even after the effect of the intercorrelation with the Leiter test has been removed. In both these cases the Leiter also contributes significantly to the explanation of variance of the verbal ability scores. Whereas field independence is an important predictor for younger Negro males, cognitive style proved irrelevent for older Negro males in the prediction of verbal ability. However, a high level of concept formation was of some importance as a predictor for these older boys, perhaps pointing to their increasing reliance on abstract relationships which would demand a broader and more refined level of concept formation. For younger Negro females their level of concept formation appears to be unrelated to their 1965 level of verbal ability and only a slight relationship exists for the field independent mode of cognitive differentiation and verbal ability.

The multiple R for these two variables in the prediction of verbal ability ranges from .36 to .79. Cognitive variables are

much more important for younger males and older females. Older females may have relized the necessity of utilizing their cognitive capacities in the most effective manner possible. (Perhaps they relize that this is a necessary means, if they are to be come dominant). The explanation for younger males remains unclear unless the effect of integration is greatest on those who function at a relatively high level cognitively, who feel they can compete with white students and not be intimidated.

Prediction Equations and Verbal Ability In the methods section a conceptual model underlay the rationale for the statistical model of the prediction equation. The importance of each class of variables varies with the sex and the grade level of the student. For grades 3 through 5 females the cognitive variables supercede all others in importance, but for the younger females their initial level of self-concept combines additively with their performance on the CEFT to predict those who will score high on the 1965 verbal ability instrument. It may be that Negro females in grades 1 and 2 must possess a sense of self-confidence, potency and control of the environment in order to differentiate cognitively in a field independent manner: When they manage to act this way their verbal performance excels. For this group the mean on the self-concept scale changes from a mean of 20.2 in 1964 to a mean of 21.1 in 1965 with the standard deviation holding constant at approximately 4.1- a non-significant change.

The direction of cause of the effect cannot be inferred directly from the data, i.e. one cannot say that a field independent cognitive style leads to higher sense of self-concept in Negro students. However, theoretically, it can be argued that a field independent cognitive style develops prior temporally to the child's sense of self-concept. The latter's development expresses a child's reaction to her social environment, a way of coping with it. If this is the case, then the grade 1 and 2 Negro female whose cognitive style emphasizes field independence, and who perceives a control of the social environment about her before she entered the integrated setting, will be the one who will benefit the most for the integrated setting, as measured by her performance as a measure of verbal ability.

Males in grades 1 and 2 who initially scored well on both the Leiter and the CEFT, will tend to be the ones who benefit the most from the integrated setting. However, those who have a high sense of self-concept in addition will benefit even more from integration. Unlike the females, their mean on the self-concept scale changes significantly from 19.8 in 1964 to 22.8 in 1965; secondly, the distribution itself contracts with the standard deviation decreasing from 5.0 to 2.0. The regression equation for this group seems to indicate that those male Negroes whose sense of self-concept indreased, who differentiated cognitively

in a field independent manner and who possessed a high level of concept formation benefitted most from the integrated setting.

Negro males in grades 3 through 5 who performed well on the verbal ability test in 1965 do not score high on any of the independent variables, except the Leiter, and their partial R reachos only a moderate level. Some variable untapped by this study (perhaps some additional aspects of the individual's social class as measured by his parents' level of education, his motivation, or his classroom behavior, etc.) constitutes the crucial variable to explain the large amount of residual variance associated with the prediction of his verbal ability score. How this older Negro male employs his high level of concept formation may depend on his background and the encouragement he receives at home to use it. The 1967 Civil Rights Commission Report (25) dramatizes the effect of social class of both home and school upon the Negroes' performance. Those male Negroes who performed well, may have come from slightly more advantaged backgrounds.

A set of prediction equations instead of merely one, points out the complexity of the relationship of integration upon the Negro student. An extreme interaction effect would have hidden these highly intriguing results if only one prediction equation had been used for the entire sample. The background variables--either cognitive or social--vary with the sex and grade level of the student as to their importance; in future research this fact should not be bypassed in carefully constructed research designs.

Teacher Ratings The grade level of the student plays a part in determining his chances of improving the rating made by his teacher for his effective use of his verbal classroom skills. In grades 1 and 2, 73.4% more whites than Negroes improve in their teacher ratings, whereas in grades 3 through 5 only 9.8% more whites than Negroes are rated higher by the teacher than they were the previous year. The exact meaning of the term "improvement in classroom verbal skills" as judged by teachers may not reflect improvement in terms of objective performance. Many non-academic factors may enter into this rating process.

Teachers change from grade to grade and with the change in teachers, the student, especially the Negro, has to restructure his set of expectations for the type of performances the teacher will reward. When the Negro child enters the integrated school setting the comparison level used to evaluate his classroom performance also changes and the judgements of his performance are based upon a new comparison level (21). If this new comparison level is at a higher level than the comparison level used to judge him the previous year, then changes in the percent of Negroes receiving high teacher ratings, may hide the story

of his actual improvement.

Table 10 also indicates that for 30.2% more Negroes than whites in grades 1 and 2, the verbal skills teacher ratings drop from a high rating in 1964 to a low rating in 1965 as is also the case for 35.8% of the Negroes in grades 3 through 5. The lack of a consistent comparison level may, in fact, explain the extreme drop for Negroes, but relative to their 1964 performance, their ability to utilize verbal skills may actually be much higher in 1965 if they would have been evaluated by the previous year's comparison level.

Similarly, the comparison level for the evaluation of whites by their teacher may have lowered from the previous year. The process of evaluating verbal skills of students relies upon a standard for comparison. Changes in the standard for Negroes and whites for their evaluation may explain the improvement of many whites and few Negroes, and the lower rating of many Negroes and few whites.

Teachers in 1965 seem to possess two different sets of expectations for students' self-concept in the way they perceive verbal skills in the classroom. In grades 1 and 2, 12.7% more Negroes with a low sense of self-concept receive high teacher ratings than those with a high sense of self-concept, whereas for whites, 10.6% more whites with high sense of self-concept receive high verbal skills teacher ratings than those with a low sense of self-concept. For grades 3 through 5 the strength of the relationship increases--17.0% more Negroes with low self-concept scores receive high teacher ratings for verbal skills than those who score high on the self-concept scale. Whites who are perceived as highly effective users of their verbal skills again tend to have a high sense of self-concept, i.e., 25.6% more whites with a high self-concept tend to be evaluated by their teachers as the more skilled in the use of their verbal skills.

Since the self-concept scale includes behaviors characterized as more potent and active, which are given the higher score, Negroes with a high self-concept, especially older males, on this scale may be viewed as too dominant by their teachers. The quiet, more passive Negro child may favorably influence his teacher's perception of him and therefore his rating. The latter may be viewed as more attentive, more willing to learn, etc., all in terms of a comparison level set for Negroes--especially Negro boys--in contrast to the one set for whites.

Since the verbal teacher ratings are not related to the more objective verbal achievement scores nor the more objective pre-integration measures, the high achieving Negro continues to do so either at the expense of his teacher's approbation, if

his self-concept is high, or, as in the case of Negro boys in grades 3 through 5, perhaps by showing greater conformity to the teacher's expectations of behavior. In some cases they may have incorporated the teacher's expectations.

Friendship Choices The limited number of respondents to the sociometric questions make it difficult to assess properly the meaning of white friendship choices. The finding that Negroes who score low in self-concept are more likely to choose two or more white friends, compared to those high in self-concept, could indicate the use of communication as a means of substitute locomotion in the hierarchy (10).

High teacher ratings for those Negro children choosing two or more white friends may either reflect the negative relationship noted previously between teacher's rating and self-concept, or else, having white friends could influence teachers via a subtle shift in perception of these Negro children as being closer to their comparison levels because of their white friends.

The higher level of performance on the Wechsler as related to friendship choices seems contrary to the findings on both self-concept and teacher's ratings, in terms of verbal achievement. However, since the interrelations cannot be completely analyzed with the limited sociometric data available, it may very well be that those high in verbal achievement choose white friends who are closer to their ability level, regardless of actual self-concept; those low in self-concept choose white friends as means of reaching a higher status; and that teacher ratings reflect choice of white friends regardless of the basis for the choice.

CONCLUSIONS AND IMPLICATIONS

The research described in this report demonstrates that it is possible to determine some of the variables related to academic achievement and self-concept changes for previously segregated children when placed in integrated classrooms.

Initial level of concept formation, positive self-concept and field independence are related to academic achievement, but a breakdown of Ss by grade level and sex reveals considerable differences in the importance these characteristics have for each group of Ss.

Thus, for grades 1 and 2 males and grades 3 through 5 females, a high level of concept formation, a positive self-concept and a field independent cognitive style predict a high verbal test score; about 92% of the variance was accounted for by these measures in both these groups.

These young males are the only ones who benefited in the integrated setting in terms of significant increases in mean scores on the self-concept scale.

For grades 3 through 5 males, initial level of concept formation is the only one of these measures related to progress--as defined by verbal ability test scores. And yet for this group very little of the total variance is accounted for, which indicates that some variable or variables untapped by this study is crucial to predict their achievement. Additional research is indicated to shed more light on this.

For the younger females in grades 1 and 2, initial level of self-concept combines with a field independent cognitive style to predict those who will score high in verbal ability. Initial level of concept formation proved unrelated to verbal ability, as measured by the vocabulary test, for this group.

The finding that different variables and combinations of variables are related to success in the integrated setting--depending upon sex or grade level--implies that we can differentially determine how integration will affect different children. Thus, despite the consequences for the group, some children may be ready for an integrated setting before others. Some of the others may need specific training in ways of coping with their environment either prior to integration, or in addition to the regular integrated curriculum, in order to fully benefit from integration. Teaching methods and materials have to be flexible to relate to the different student needs.

there for one reason or another integration proceeds slowly, those children who are most likely to succeed can be placed first, while the others could be given prior training to increase their chances of success.

Implications for individualized pre-school training are also implied by these findings.

Of course, the factors untapped in this study, (perhaps motivation and social class), but which additional research may reveal, must also be considered.

Verbal ability of Negroes is also related to the degree of interracial classroom interaction. Regardless of sex or grade level, those who scored high on the vocabulary test tended to choose white friends more frequently. The resultant communication may have expanded their vocabularies and developed skills of articulation and comprehension. This finding implies that classroom interaction should be encouraged and fostered by the schools.

However, contrary to initial predictions, level of self-concept is inversely related to degree of interracial interaction for Negroes. Those Negro students low in self-concept may be using communication as a means of substitute upward movement in order to bolster their lower self-image. Those findings seem contrary to those concerning friendship choices and verbal ability, in view of the latters' relation to positive self-concept. Of course, the limited sociometric data make it difficult to draw firm conclusions. Perhaps those high in verbal achievement choose white friends closer to their own ability regardless of actual self-concept. In the long run true friendships may develop and self-concept increase. Additional information on classroom interaction and communication is needed to clarify these issues.

Teacher ratings in verbal skills were not related to either of the preintegration cognitive measures nor to the verbal ability test scores. They were negatively related to self-concept scores. In fact, after integration, teacher ratings generally dropped for Negro students compared to those given the year before, whereas they increased for white students. This indicates that teacher ratings are questionable and their comparability is dubious. Teachers change from year to year and the set of expectations they have for their students varies.

In view of the fact that Negro students in grades 3 through 5--for whom pre as well as post integration measures of verbal ability were available--performed significantly closer to the white mean after integration, further doubt is placed on the value of these teacher ratings.

It appears that the teachers set higher comparison levels to evaluate Negro children after integration than the ones used the previous year--and actual improvement is hidden. Teachers should be alerted to these tendencies and trained to avoid the problems they create.

Incidentally, these test results for grades 3 through 5, (which reflect an increase of .75 and .32 standard deviations for the females and males respectively in the integrated setting) lead one to conclude that integrated education is vital. The Negro and white segregated schools were comparable in staff and equipment; yet the Negro Ss didn't do as well verbally before as they did after integration. This implies that compensatory education should not replace integrated education.

In addition, earlier integration seems more beneficial than that which occurs in later school years. On the verbal ability test, Negro males in grades 1 and 2 were much closer to the white mean than those integrated in grades 3 through 5. Female test results were inconclusive. However, more Negro males and females in the lower grades were rated higher in verbal skills by teachers than those in the higher grades. Despite the dubious value and subjective qulaity of these ratings, as concluded above, they do play an important part in the child's school career.

In summation, this study indicates that the consequences of integration and the factors related to successful integration for the individual child can be determined.

SUMMARY

This project was concerned with school integration in a suburban New York community. Previously segregated Negro children were studied before and after spending one year in an integrated setting in order to determine relationships between the pre-integration characteristics of the children, the nature of the integrated contact and achievement in the new classroom situation. More specifically this study was concerned with the influence of level of concept formation, cognitive style and self-concept, (all pre-integration variables) and classroom communication patterns in the integrated setting, upon academic achievement and self-concept changes after integration.

The following hypotheses were investigated:

Hypothesis 1 - The higher the initial level of concept formation, the greater the progress following integration.

Hypothesis 2 - The higher the initial level of concept formation, and the more positive the self-concept of the child, the greater the achievement in the integrated classroom.

Hypothesis 3 - Field independent children with high levels of concept formation and a good self-image will show higher achievement than field independent children who do not have high levels of concept formation and a positive self-image. Field dependent children who have low initial levels of concept formation, and a poor self-image will show low academic achievement.

Hypothesis 4 - There will be an inverse relationship between grade and academic achievement following integration.

Hypothesis 5a -There will be a positive relationship between the degree of interracial interaction within the classroom for Negro Ss and their level of self-concept.

Hypothesis 5b -There will be a positive relationship between the degree of interracial interaction within the classroom for Negro Ss and their academic achievement.

The community chosen for this study was a middle-class suburb in the Greater New York area. The Negro families in the community exhibited primarily lower class backgrounds.

Before integration there were three public elementary schools with comparable physical plants, equipment and staff. One of these schools was 90% Negro. In 1965 this school was closed and the pupils were placed in classes of the other two schools.

The total population of all Negro school children from first through fifth grade constituted the Ss in the study. All 87 came from lower class backgrounds. A group of 63 randomly selected white children were used for comaprison purposes.

Prior to integration, the Leiter test of concept formation--a non-verbal test--and the Children's Embedded Figures Test (CEFT), a test of cognitive style, were administered to the Negro Ss. The latter is a test of psychological differentiation which yields data on field dependent or field independent cognitive style. A self-concept test developed by the investigators was administered to both the Negro and white students.

Classroom interaction in the integrated setting was measured by the number of white friendship choices for the Negro Ss.

Following one year of integration academic achievement was measured primarily by a verbal ability test; teacher ratings were also used. The self-concept test was readministered to measure changes in self-image after one year of integrated classroom experience.

Ss were divided into four groups (by sex and grade level) and regression equations were used to predict verbal ability. Comparisons were also made on the various measures for the Negro Ss and the white sample.

For those students in grades 3 through 5, a pre- as well as a post-integration measure of verbal ability was available. The Negro mean was much closer to the white mean in 1965 than in 1964, i.e. -.96 standard deviations compared to -1.41 standard deviations. For both years the males were closer to the white mean (-1.22 SD's from white mean in 1964 and -.90 SD's below in 1965), but the females showed the most improvement: from -1.80 SD's in 1964 to -1.13 SD's in 1965.

In terms of the post-integration verbal test scores (available for all grade levels), the males in grades 1 and 2 performed closer to the white mean (-.69 SD's) than did those in grades 3 through 5; females performed the same at both grade levels (-1.13 SD's).

In terms of the post-integration verbal test scores (available for all grade levels), the males in grades 1 and 2 performed closer to the white mean (-.69 SD's) than did those in grades 3 through 5; females performed the same at both grade levels (-1.13 SD's).

For grades 1 and 2 males and grades 3 through 5 females the cognitive variables (concept formation and cognitive style) were good predictors of verbal ability. A field independent cognitive style proved more closely related, but level of concept formation also made a contribution. Both pre and post levels of self-concept contributed moderately to the prediction for these two groups. Approximately 92% of the variance was accounted for by all of these variables.

Pre-integration self-concept proved to be the best predictor of post-integration verbal ability for grades 1 and 2 females. Cognitive style contributed moderately to the prediction; concept formation level had little effect: about 66% of the variance was accounted for by these variables.

For grades 3 through 5 males, cognitive style and the self-concept measures had no predictive power. Level of concept formation made a moderate contribution. Relatively little of the variance (about 30%) was accounted for, indicating some untapped variable or variables, is or are relevant to success for this group.

Prior to integration, Negroes and whites at both grade levels were alike in self-concept. After integration, self-concept for grades 1 and 2 Negro males increased. There was a drop for grades 1 and 2 white students. No other changes occurred.

Verbal teacher ratings were not related to either of the two cognitive test scores nor to the verbal ability test scores. In fact, following integration, Negroes at all grade levels were rated lower in verbal skills than they were the year before--despite contrary evidence from the verbal test scores. The higher the grade level, the lower the rating tended to be. White students were more likely to receive higher ratings. Negroes were more likely to be rated high in verbal skills if they scored low in self-concept; the opposite was true for the white students.

Choice of two or more white friends by Negroes was positively related to verbal ability test performance and teacher ratings, but inversely related to self-concept scores.

The results generally support the hypotheses and indicate that it is possible to predict which factors and combination of factors determine achievement in the integrated setting. However, although concept formation, field independence and positive

self-concept were related to academic achievement, as measured by a verbal ability test, the ability of each of these measures and their combination to predict, varied with grade and sex. Such findings indicate that any special training given to foster benefits of integration should vary with the needs, grade, and sex of the child.

For the older boys, as yet untapped variables--perhaps motivation and subtle class factors--are more important determinants of success than those considered. Further investigation is needed here.

Teachers ratings are quite subjective and unrelated to the more objective data. In fact, for the upper grades, teacher ratings for Negroes dropped after integration, whereas verbal test scores increased. (The latter finding strongly points out the benefits obtained from integrated education, even when compared to "good" segregated schools.) Teachers probably used higher comparison levels against which to evaluate Negroes than were used the year before. This is an important finding for schools and teachers to consider in view of the heavy weight placed on teacher judgments. Such ratings may have been the basis used when integrated programs were judged unsuccessful.

Verbal ability test scores are inversely related to grade level for male Negroes, partially supporting hypothesis 4. Further support was found in the teacher ratings which dropped more for older Negro children of both sexes.

Interracial classroom interaction was positively related to academic achievement (hypothesis 5b) but contrary to hypothesis 5a was inversely related to level of self-concept. Perhaps those low in self-concept used communication with white children as a means of substitute locomotion in the hierarchy. The limited communication data available leave many unanswered questions and indicate the need for further study in this area.

This study indicates that the consequences of integration and the factors related to successful integration for the individual child can be determined. Many of these factors have been revealed here. Further investigation would amplify these findings.

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APPENDIX A

Index of Socioeconomic Status

INSTITUTE FOR DEVELOPMENTAL STUDIES
Department of Psychiatry
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Instructions in Use of the Index of Socioeconomic Status

The index of socioeconomic status (SES) developed at the Institute for Developmental Studies in New York City utilizes two factors to evaluate the relative social positioning of individuals in a given community. These factors are identified as:

1. occupation of main support of the family
2. education of main support of the family

Implicit assumptions in the use of the scale are that:

1. within any family unit, the social status of an individual can be derived from certain characteristics of the head of that family, and
2. within a community certain individuals are accorded more prestige than others on the basis of their occupation, education and/or income.

The following instructions outline the steps in obtaining an SES rating for children who are to be tested. The procedure involved is simple and the rating can be obtained in a few short steps.

INSTRUCTIONS

1. Find the occupation of the specified head of the family in the occupational classification given in the following pages:

OCCUPATIONAL RATING SCALE

OCCUPATION	RATING
U.S. Supreme Court Justice U.S. Diplomat or Foreign Service State Governor, Mayor of large city U.S. Cabinet Member U.S. Senator, Congressman Physician College President or Chancellor College Professor Scientist (Government or other) State Attorney Bank Executive Investment Broker Captain of ocean-going vessel	10
County Judge Department Head, State Government Motion Picture Actor, (not "extra") Minister Lawyer Architect Postmaster, City Chemist Dentist Electronic Engineer Nuclear Physicist Civil Engineer Mathematician Radio entertainer (except announcer) Director, Large Corporation Business Executive, Advertising Executive Airplane Pilot Inventor	9
Editor-Owner newspaper Psychologist Veterinarian Historian, Economist Sociologist Medical Researcher, Biologist Author Accountant, C.P.A. Registered Nurse Justice of the Peace Government Investigator (FBI, Justice Dept., etc.) Artist, performing artist Professional Athlete	8

OCCUPATION	RATING
Interior Decorator, Industrial Designer, Fashion Designer	8 (con't)
Factory, Department Store Owner	
High School Teacher	
Building Contractor	
Radio Operator	
Mine owner-operator	7
Owner of logging camp	
Musician in symphony orchestra	
Small Retail Owner	
Sheriff-County	
Army - Captain or above	
Elementary School Teacher	
Railroad-Supervisory	
Real Estate Agent	
Agricultural Agent - County	
Laboratory Technician	
Detective of Police	
Fire Lt. or above	
Private Secretary	6
Undertaker	
Social, Welfare Worker	
Foreman or Supervisor, Factory	
Labor Union official - National only	
Radio Announcer	
Farm owner - operator	
Hotel Manager	
Newspaper Columnist	
Owner-operator print shop	
Railroad Engineer	
Electrician	
Watchmaker, factory	
Trained Machinist	
Mason	
Dental Technician	
Auto Salesman	
Office Manager	
Owner-operator dry cleaning	5
Linotype operator, printer	
Newspaper reporter, proofreader	
Oil well driller (not engineer)	
Manager small store	
Policeman, private investigator	
Mail clerk, carrier	
Bookkeeper	
Insurance Agent	

OCCUPATION	RATING
Traveling Salesman	1
Receptionist, typist secretary	
Bank Clerk	5 (con't)
Railroad Conductor, ticket agent	
Practical Nurse	
I.B.M. Keypunch operator	
Playground worker	
Teachers Aid	
Structural Iron worker	
Carpenter	
Pawnbroker	
Tenant farmer	
Auto mechanic	
Dressmaker	
Beautician	4
Plumber	
Telephone operator, lineman	
Labor union official - Local only	
Lunch stand operator	
Painter, house and/or non factory	
Saleselerk, grocery clerk	
Musician - popular, dance, singer	
Furniture finisher	
T.V. repairman	
Fireman	
Welder, offset pressman	
Machinist-Factory	
Barber	
Shoe repair man	
Railroad baggage handler	
Other semi-skilled	
Cook - restaurant or hotel, short order	
Chauffeur - private	3
Fisherman	
Motorman, bus driver, conductor	
Milk route man	
Shipping clerk	
Cashier	
Merchant seaman	
Truck driver	

OCCUPATION	RATING
Gas station attendant Quarry worker Night club singer Porter-railroad Taxi driver Waiter - Bartender Farm worker All unskilled laborers Coal miner Night watchman Janitorial - Building superintendent Elevator operator Freight handler Nurse's Aide	2
Laundry worker Newsboy Soda clerk Peddler Grinder - tool, etc. Odd job worker Share cropper - migratory worker Scrub woman Garbage collector Street sweeper Shoe shiner	1

2. Occupational categories have been grouped into clusters; each has a prestige rating. Assign a rating to each child based on the occupation of main support of his family. For example, U.S. Supreme Court Justice is rated "10," Milk Route Man is rated "3." This number will be the occupation rating for each child.

3. Similarly, the education level of the head of the child's family is to be rated.

4. The following table specifies the ratings to be assigned for level of education of the main support in the child's family.

*1A - Welfare - ADC

EDUCATION	RATING
0-4 years	1
5-6 years	2
7-8 years	3
Some high school	4
High school graduate	5
Some college	6
College graduate	7
Post graduate or professional training	8

5. You now have two (2) ratings for each child. On the basis of these two ratings (occupation and education) you can now derive an estimated SES rating for each child as follows:

6. Referring to the table below:

SES CONVERSION TABLE

Education of Main Support

Occupation of Main Support	1	2	3	4	5	6	7	8
1	1	1	1	1	1	II	II	II
2	I	I	I	I	II	II	II	III
3	I	I	I	I	II	II	III	III
4	I	I	I	II	II	III	III	III
5	I	I	I	II	II	III	III	III
6	I	I	II	II	III	III	III	III
7	I	II	II	III	III	III	III	III
8	II	II	II	III	III	III	III	III
9	II	II	III	III	III	III	III	III
10	II	II	III	III	III	III	III	III

1. locate the occupation rating of main support for a given child on the left hand side of the figure;

2. locate the education of main support for a given child across the top of the figure;

3. find the coordinate of these two by bringing your finger down to the point where they both meet. You will find that they meet in a box numbered I, II or III. This numerical value is the overall SES rating for the child.

7. Enter this number in the space marked "SES-A" in the lower right hand corner of the childs Background Information Sheet.

8. In the space marked "SES-B" enter your own judgemental estimate of the childs relative social status based on any familiarity that you may have with the child or his family. Use the numerals I, II or III where I will represent "Low" and III will represent "High".

APPENDIX B

Denmark Self-Concept Test

Self-Concept Rating Scale

short: _____ : _____ : _____ : tall (not scored)

lazy: _____ : _____ : _____ : hard-working

sad: _____ : _____ : _____ : happy

strong: _____ : _____ : _____ : weak

poor: _____ : _____ : _____ : rich

funny: _____ : _____ : _____ : serious

clean: _____ : _____ : _____ : dirty

quiet: _____ : _____ : _____ : loud

sick: _____ : _____ : _____ : healthy

good: _____ : _____ : _____ : bad

cold: _____ : _____ : _____ : warm

smart: _____ : _____ : _____ : dumb

light: _____ : _____ : _____ : dark

fast: _____ : _____ : _____ : slow

stuck-up: _____ : _____ : _____ : friendly